

Supporting STAAR™ Achievement:
Targeting the TEKS and Readiness
Standards
Grade 4 Mathematics
Teacher Edition

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SAMPLE

What Is *Supporting STAAR™ Achievement: Targeting the TEKS and Readiness Standards?*

1

A resource that focuses on the TEKS identified as readiness standards while integrating appropriate supporting standards and mathematical processes and skills

2

A resource that provides opportunities for rigorous mathematical conversations while providing supports for students at varying levels of readiness

3

A resource that provides support for English language learners and students struggling to learn mathematics through Tier I differentiated activities, preteaching experiences, scaffolds for activities such as hint cards and graphic organizers, and facilitation questions

4

A resource that supports beginning as well as experienced teachers through clear instructions and facilitation questions that focus on potential stumbling blocks for students in the effort to bridge to formal understanding of mathematics

5

A resource of classroom-ready 5E lessons. The Engage phase of each lesson consists of a student-centered activity that either bridges from students' prior knowledge or encourages interest in deeper exploration of the concepts in the lesson. The Explore phase of each lesson provides students with an opportunity to "do mathematics" and begin to formulate ideas and conjectures. In the Explain phase of each lesson, students formalize the mathematical ideas from the Explore phase with a focus on academic vocabulary, as well as procedures related to the concepts. The Elaborate phase of each lesson allows students to apply or extend their understanding of the concepts in the lesson. The Evaluate phase consists of four selected-response or griddable items that can be used to assess student understanding.

What Is in a Lesson Found in *Supporting STAAR™ Achievement: Targeting the TEKS and Readiness Standards?*

Each readiness standard has been rewritten in student-friendly language so that students may gauge their learning.

Additional TEKS that support the conceptual and procedural development of the readiness standard within this lesson are identified.

Relationships between Paired Numbers

Relationships between Paired Numbers

Readiness Standard

4.7A The student is expected to describe the relationship between two sets of related data such as ordered pairs in tables.

Content Objective

I can describe relationships between paired numbers by using words and numbers.

Additional TEKS

- 4.15A The student is expected to explain and record observations using objects, words, pictures, numbers, and technology.
- 4.15B The student is expected to relate informal language to mathematical language and symbols.
- 4.16A The student is expected to make generalizations from patterns or sets of examples and nonexamples.
- 4.16B The student is expected to justify why an answer is reasonable and explain the solution process.

ELPS

c3D The student is expected to speak using grade-level content area vocabulary in context to internalize new English words and build academic language proficiency.

Language Objective

I can talk with a partner about mathematical relationships between paired numbers.

Prerequisite Knowledge

- Understanding how to describe patterns in sequences of numbers
- Understanding how to read a table to describe matched pairs of numbers

Vocabulary Focus

Additive
Expression
Multiplicative
Ordered Pairs
Pattern
Process Column
Relationship
Sequence

Each lesson includes an English Language Proficiency Standard rewritten in student-friendly language.

Each lesson includes prerequisite knowledge that may impact student success within the lesson as well as vocabulary that will be used during the lesson.

Level: Grade 4

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What Is in a Lesson Found in *Supporting STAAR™ Achievement: Targeting the TEKS and Readiness Standards?*

Materials for each phase are summarized on one page for ease in preparation.

Grouping strategies for each phase are summarized to assist in the arrangement of the classroom.

Relationships between Paired Numbers



Notes
 > Read and select facilitation questions as appropriate to meet your students' needs.

	Materials	Instructional Grouping
Preteach	<ul style="list-style-type: none"> ♦ Pattern Cards (1 set per student, cut) ♦ Table Patterns 	Small group with teacher facilitation

Phase	Materials <i>one per student unless otherwise noted</i>	Instructional Grouping
Engage	<ul style="list-style-type: none"> ♦ Find Your Spot! Posters for display ♦ Find Your Spot! Cards (1 card per student, cut) ♦ Find Your Spot! Cards* (1 card per student, cut) 	Whole-group discussion
Explore	<ul style="list-style-type: none"> ♦ Party Patterns ♦ Description Cards ♦ Party Line Directions for display ♦ Scissors ♦ Glue or tape 	Pairs of students
Explain	<ul style="list-style-type: none"> ♦ Relationships between Paired Numbers Notes 	Whole-group discussion
Elaborate	<ul style="list-style-type: none"> ♦ Round Robin: Patterns in Tables ♦ Hint Cards* (1 set per student, cut) ♦ Clocks with gears 	Groups of 4 students
	Intervention <ul style="list-style-type: none"> ♦ Round Robin: Patterns in Tables ♦ Clocks with gears 	Small group with teacher facilitation
Evaluate	<ul style="list-style-type: none"> ♦ Evaluate: Relationships between Paired Numbers 	Individual

The Elaborate phase has two concurrent components: a student-facilitated activity and a teacher-facilitated activity that focuses on the needs of students struggling with the content.

for targeted students only

Materials that are provided as supports for students in need of additional help are labeled with an asterisk.

What Is in a Lesson Found in *Supporting STAAR™ Achievement: Targeting the TEKS and Readiness Standards?*

Relationships between Paired Numbers

Preteach

1. Distribute a set of **Pattern Cards** and **Table Patterns** to each student.
2. Prompt students to match each picture of cars to the corresponding total number of wheels.
3. Prompt students to record the relationship between the number of cars and the number of wheels in a process table. Prompt students to enter the data as pairs of associated numbers rather than filling in by column.
 - *What do you notice about the data in this table? Listen for whether students describe patterns recursively (what comes next) or relationally (how x turns into y).*
4. Ask the following questions of students.
 - *What can I do to turn x of 2 into y of 8?*
 - *Which operation (addition, subtraction, multiplication, or division) could we use to get from x to y ?*
 - *Does adding 6 to the x -value always give the y -value in this table?*
 - *Does multiplying the x -value by 4 always give the y -value in this table?*
5. Prompt students to fill in the process column with you to show which rule works for the entire table of data.
6. Create additional tables for students as needed. For example, use different number of cars or find the relationship between the number of bikes and wheels.

Engage

1. Post the **Find Your Spot! Posters** on the wall in different areas of the classroom.
2. Distribute one **Find Your Spot! Card** to each student.
3. Prompt students to stand by the **Find Your Spot! Poster** that describes the relationship between the two input and output on their **Find Your Spot! Card**.
4. Prompt students to explain to the other students at the **Find Your Spot! Poster** how they know the relationship between their two sets of numbers.

Supports
Students may use the **Find Your Spot! Cards***.

Facilitation Questions

- **When moving from 6 to 18, 6 times what number is equal to 18?**
- **Are the numbers in the first column multiplied by the same factor each time to generate the paired number in the second column?**
 - **If so, by what number?**
- **How could you use guess and check to help you match the expression with the number pattern?**

Listen for . . .

- *Students connecting each number in the first column to the second column through multiplication.*
- *Students describing strategies such as guess and check by multiplying a number in the first column by one of the factors posted on the wall.*

Each lesson includes a preteach activity that teachers may use with students who might benefit from exposure to related concepts prior to the lesson.

Each phase includes directions to implement the activity and the identification of additional student supports for the activity.

Each phase includes facilitation questions to help students who may be struggling to interpret or process components of the activity.

What Is in a Lesson Found in *Supporting STAAR™ Achievement: Targeting the TEKS and Readiness Standards?*

Titles of activity masters and student pages are printed in bold for ease of reference.

Relationships between Paired Numbers

10. Prompt students to choose their own input and output values and record the process used to determine their answers in the table for the example of a multiplicative relationship.
11. Prompt students to compare their examples of multiplicative relationships.
12. Repeat the process for the example of an additive relationship.

Elaborate

1. Distribute a different problem from the **Round Robin: Patterns in Tables** to each member of the group.
2. Provide students a clock with gears to solve Problem C.
3. Prompt students to read the directions on the student page in order to complete the activity.
4. If a student appears to be struggling with **Round Robin: Patterns in Tables**, the student may use **Hint Cards*** to complete the activity independently or join the teacher-led intervention group.

Intervention

1. Distribute Problem A from **Round Robin: Patterns in Tables** to each student.
2. Read Problem A aloud to the students.
3. Ask, "What do you know about the problem?"
4. Ask, "What do you not know?"
5. Ask, "What is being compared in the problem?"
6. Prompt students to create a table in step one of **Round Robin: Patterns in Tables**.
 - If needed, display the tables from the Party Patterns recording sheets used during the Explore Phase to assist students in creating the table.
 - If needed, allow students to use a calculator to help generate the table.
7. As students work to create their tables, pose the following questions:
 - What headings or labels should you put in the table?
 - What information is given in the problem that needs to be included in the table?
8. Prompt students to pass their **Round Robin: Patterns in Tables** recording sheets to the right.
9. Explain that an expression uses numbers and symbols to represent the problem.
10. Ask, "How could you write, 'Ms. Sanchez placed 105 flowers into equal groups of 7' using numbers and symbols?"
11. Prompt students to complete step two of **Round Robin: Patterns in Tables**.
12. Prompt students to pass their **Round Robin: Patterns in Tables** recording sheets to the right.
13. Ask, "How could you use words to describe how to find the number of rows Ms. Sanchez planted for 84 flowers?"
14. Prompt students to complete step three of **Round Robin: Patterns in Tables**.
15. Prompt students to pass their **Round**

The Tier I intervention provides instructions on how to make the mathematics content more explicit for students struggling with the concepts within the lesson. The activity is at the same rigor as the activity being completed by the students in a self-directed environment.

What Is in a Lesson Found in *Supporting STAAR™ Achievement: Targeting the TEKS and Readiness Standards?*

Relationships between Paired Numbers

Robin: Patterns in Tables recording sheets to the right.

16. Prompt students to complete step four of **Round Robin: Patterns in Tables**.
17. Pose the following question:
 - How might a calculator help you determine if you agree or disagree with your group members?
18. Prompt the students to return the **Round Robin: Patterns in Tables** recording sheets to the owner.
19. Ask, "What relationships do you notice in the problem?"
20. If students demonstrate continued need for support, repeat this process for another problem on **Round Robin: Patterns in Tables**. If students appear ready to work with a partner or independently, allow the students to do so.
21. Provide students a clock with gears to solve Problem C.

Evaluate

Question Number	Correct Answer	Reporting Category	TEKS	TEKS	Conceptual Error			Procedural Error		Guess
1	C	2	4.7A	4.15A	A	B	D			
2	D	2	4.7A	4.16A	A	C		B		
3	A	2	4.7A	4.16A	C	D		B		
4	D	2	4.7A	4.15A	B			A	C	

Each selected-response item is labeled with the STAAR™ reporting category, a content student expectation, and an underlying processes and tools student expectation as appropriate. Incorrect answer choices are classified according to type.

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Supporting STAAR™ Achievement: Grade 4

Multiplication and Division

Readiness Standards

4.4D The student is expected to use multiplication to solve problems (no more than two digits time two digits without technology).

4.4E The student is expected to use division to solve problems (no more than one-digit divisors and three-digit dividends without technology).

Content Objective

I can identify when to use multiplication and/or division to solve a problem by classifying problems as combining equal groups or separating equal groups.

Additional TEKS

4.14B The student is expected to solve problems that incorporate understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness.

4.14C The student is expected to select or develop an appropriate problem-solving plan or strategy, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem.

4.14D The student is expected to use tools such as real objects, manipulatives, and technology to solve problems.

ELPS

c5F The student is expected to write using a variety of grade-appropriate sentence lengths, patterns, and connecting words to combine phrases, clauses, and sentences in increasing accurate ways as more English is acquired.

Language Objective

I can explain my solution process using complete sentences with correct vocabulary.

Prerequisite Knowledge

- Understanding of flexible strategies for multiplication and division
- Understanding of two-digit times one-digit multiplication procedures
- Understanding of how to model division and represent the model with a number sentence

Vocabulary Focus

Combine
Factor
Product
Quotient
Separate

Notes

- Read and select facilitation questions as appropriate to meet your students' needs.

	Materials	Instructional Grouping
Preteach	<ul style="list-style-type: none"> ◆ Notebook paper 	Small group with teacher facilitation

Phase	Materials <i>one per student unless otherwise noted</i>	Instructional Grouping
Engage	<ul style="list-style-type: none"> ◆ Response Signs ◆ Combine or Separate? for display ◆ Combine or Separate?* 	Individual or pairs of students
Explore	<ul style="list-style-type: none"> ◆ Combine or Separate? (1 per pair) ◆ R.A.F.T. Guide (1 per pair) ◆ Problem Sort Mat ◆ Problem Sort Cards ◆ Problem-Solving Board* ◆ Base ten blocks ◆ Scissors ◆ Tape or glue 	Pairs of students
Explain	<ul style="list-style-type: none"> ◆ Multiplication and Division Notes 	Whole-group discussion
Elaborate	<ul style="list-style-type: none"> ◆ Make It My Own Directions for display ◆ Make It My Own Cards (1 set per group) ◆ Make It My Own 	Groups of 4 students
	<p>Intervention</p> <ul style="list-style-type: none"> ◆ Make It My Own Sentence Frames* 	Small group with teacher facilitation
Evaluate	<ul style="list-style-type: none"> ◆ Evaluate: Multiplication and Division 	Individual

* for targeted students only



Preteach

1. Prompt students to turn their notebook paper so that the 11" side is parallel to the bottom edge of the desktop. Prompt students to use the lined paper to line up place values.

	3	9
×	6	
2	3	4

	3	9	
×	6		
	5	4	
+	1	8	0
	2	3	4

	4	2	
×	2	7	
2	9	4	
+	8	4	0
1	1	3	4

	4	2	
×	2	7	
	1	4	
2	8	0	
	4	0	
+	8	0	0
1	1	3	4

2. Model how to use the traditional multiplication procedure to determine the product of a two-digit factor and a one-digit factor.
 - *What place value language did you hear as I used multiplication to find the product?*
3. If needed, model how to use flexible strategies such as partial products to solve multiplication problems.
4. Prompt students to use the same procedure to determine the product of two two-digit factors.
 - *Describe the process you used to multiply the two factors.*
5. Repeat as needed for students to develop proficiency with the procedure.
6. Model how to use the traditional division procedure to determine the quotient of a two-digit number divided by a one-digit number.
 - *What place-value language did you hear as I used division to find the quotient?*
7. If needed, model how to use flexible strategies such as repeated subtraction (using estimation) to solve division problems.
8. Prompt students to use the same procedure to determine the quotient of a three-digit number divided by a one-digit number.
 - *Describe the process you used to determine the quotient.*
9. Repeat as needed for students to develop proficiency with the procedure.



Engage

1. Distribute one set of **Response Signs** to each student.
2. Read aloud one of the problems from **Combine or Separate?**
3. Prompt students to hold up the appropriate sign to identify the action implied by each problem.
4. Repeat Steps 2–3 for the remaining problems.

Supports

Provide students with **Combine or Separate?***

Facilitation Questions

- **If you acted out splitting 152 pencils equally into four bags, what would it look like?**
- **Would you combine equal groups of pencils or separate the pencils into equal groups?**
- **If there were 14 bags in front of you and there were 20 baseballs in each bag, how would you find the total number of baseballs in the bags?**
- **If you acted out this problem, would you join sets together or separate a set into equal groups?**

- **Visualize a box with 36 pencils. Visualize that box on your desk. Visualize 15 more boxes of pencils on your desk. How would you determine the total of all of the pencils?**

Listen for . . .

- *Students identifying the known and unknown parts of the problem.*
- *Students using repeated addition or subtraction.*
- *Students connecting joining equally-sized groups to combining equal groups.*
- *Students connecting distributing objects into equal groups to separating a set into equal groups.*

 **Explore**

1. Student will use **Combine or Separate?** and follow the directions on the **R.A.F.T. Guide** to complete the activity.
2. Upon completion of the **R.A.F.T. Guide**, debrief with the following questions:
 - How were your two descriptions similar? How were your two descriptions different?
3. Prompt the students to complete **Problem Sort**.
4. Upon completion of **Problem Sort**, debrief with the following questions:
 - How were these problems similar to the problems in **Combine or Separate?** How did you determine into which column to sort each card?

Facilitation Questions

- **What happened to your model when you acted out the problem?**
- **How would that model describe what happened?**
- **What is known about the problem?**
- **What is unknown about the problem?**
- **What is your plan for solving the problem?**
- **Are you combining equal groups in the problem or separating a set into equal groups?**
- **What operation does that action represent?**

Listen for . . .

- *Students identifying the known and unknown parts of the problem.*
- *Students describing the regrouping process necessary to combine groups or separate a set into equal groups.*
- *Students connecting combining equal groups to the use of multiplication and separating a set into equal groups to the use of division.*

Supports

Provide students with **Problem Solving Board*** to guide their solution process for each problem.



Explain

1. Prompt students to look at **Combine or Separate?** Prompt students to make observations about the operation used to solve problems identified as “combining equal groups.” Listen for students connecting combining equal groups to the operations of addition and multiplication.
 - What operation did you use to determine the solution to one of the “combine equal groups” problems?
2. Prompt students to look at **Problem Sort.** Prompt students to describe how they determined multiplication was the operation needed to solve the problems sorted into the multiplication section on the Sorting Mat. Listen for students identifying multiplication as the operation to use when combining equal groups.
 - Which problems could be solved by combining equal groups?
 - What operation could you use to determine the solution?
3. Provide students with the definition of multiplication: Combining equal groups to determine a product. Prompt students to record this definition on **Multiplication and Division Notes.**
 - How is this different from addition?
 - When would it be similar to addition?
4. Prompt students to complete the remaining sections on the multiplication portion of **Multiplication and Division Notes.**
5. Prompt students to look at **Combine or Separate?** Prompt students to make observations about the operation used to solve problems identified as “separating a set into equal groups.” Listen for students connecting separating a set into equal groups to division operation.
 - What operation did you use to determine the solution to one of the “separate into equal groups” problems?
6. Prompt students to look at **Problem Sort.** Prompt students to describe how they determined division was the operation needed to solve the problems sorted into the division section on the Sorting Mat. Listen for students using division to separate a set into equal groups.
 - Which problems could be solved by separating objects into equal groups?
 - What operation could you use to determine the solution?
7. Provide students with the definition of division: Separating a set into equal groups to find a quotient. Prompt students to record this definition on **Multiplication and Division Notes.**
 - How is this different from subtraction?
 - When would it be similar to subtraction?
8. Prompt students to complete the remaining sections on the division portion of **Multiplication and Division Notes.**



Elaborate

1. Distribute **Make It My Own Cards** and **Make It My Own.**
2. Display **Make It My Own Directions.**
3. If a student appears to be struggling with **Make It My Own**, the student may use **Make It My Own Sentence Frames*** to complete the activity independently or join the teacher-led intervention group.

Intervention

1. Distribute the multiplication card from **Make It My Own Sentence Frames*** to each student.
2. Read the card aloud to the students. Pose the following questions:
 - What is a reasonable two-digit number of crates of milk?

- What is a reasonable two-digit number of milk bottles in each crate?
3. Prompt the students to fill in the blanks on their cards as you read the problem aloud with the group's numbers.
 4. Ask, "What question could I ask that would require me to multiply the number of crates and the number of milk bottles in each crate?"
 5. Allow each student to respond.
 6. Prompt the students to record their question on the card.
 7. If students demonstrate continued need for support, repeat this think-aloud process for another card. If students appear ready to work with a partner or independently, allow students to do so.


Evaluate

Question Number	Correct Answer	Reporting Category	TEKS	TEKS	Conceptual Error			Procedural Error			Guess
					A	B	C				
1	D	1	4.4D	4.14C	A	B	C				
2	A	1	4.4E	4.14A	B	C	D				
3	448	1	4.4D	4.14B							
4	B	1	4.4E	4.14B	A	C	D				

Problem Sort (Answer Key)

1. Cut apart the **Problem Sort Cards**.
2. Read each problem and determine if you would use multiplication, division, or a combination of operations to solve the problem.
3. Sort the problem into the appropriate section on the Sorting Mat.
4. Tape or glue the cards into the correct section.
5. After you have sorted the problem situations, pick one problem from each section to solve and record your work on a separate piece of paper.

Sorting Mat

<p>Use multiplication to solve these problems:</p> <p>Problem 2: 352 ounces Problem 3: 288 fourth-grade students</p>	<p>Use division to solve these problems:</p> <p>Problem 1: 16 crates Problem 6: 17 players</p>
<p>Use addition or subtraction as well as multiplication or division to solve these problems:</p> <p>Problem 4: 884 cards Problem 5: 59 pencils</p>	

Name: _____

Multiplication and Division

Problem-Solving Board*

What is known about the problem?	What is unknown about the problem?
What is your plan for solving the problem?	
Carry out your plan.	
How do you know your answer is reasonable?	

SAMPLE

Make It My Own (Answer Key)

<p>My Problem</p> <p><i>Responses may vary. Possible responses include—</i></p> <p>The Garden Grocery store had 14 crates of milk. Each crate contained 26 bottles of milk. How many bottles of milk did the Garden Grocery store have in all?</p>	
<p>Student 1: _____</p> <p>Which operation(s) should be used to solve this problem? Why?</p> <p>Multiplication because I am combining equal groups of bottles of milk.</p>	
<p>Student 1's Work</p> <p><i>Responses may vary.</i></p>	<p>Answer</p> <p>364 bottles of milk</p>
<p>Student 2: _____</p> <p>Which operation(s) should be used to solve this problem? Why?</p> <p>Multiplication because I am combining 14 groups of 26.</p>	
<p>Student 2's Work</p> <p><i>Responses may vary.</i></p>	<p>Answer</p> <p>364 bottles of milk</p>
<p>Student 3: _____</p> <p>Which operation(s) should be used to solve this problem? Why?</p> <p>Multiplication because I have 14 sets of 26 that need to be put together.</p>	
<p>Student 3's Work</p> <p><i>Responses may vary.</i></p>	<p>Answer</p> <p>364 bottles of milk</p>

Make It My Own Sentence Frames* (Answer Key)

Responses may vary. Possible responses include—

Multiplication

The Garden Grocery store had 14 crates of milk. Each crate contained 26 bottles of milk. How many bottles of milk did the Garden Grocery store have in all?

Division

Coach Wheeler had 116 jump ropes to share equally among 4 classes at Briar Grove elementary school. How many jump ropes did each class get?

Addition and Division

Taryn had 126 pennies and 150 nickels. If she split the coins into 6 stacks, how many coins were in each stack?

Addition and Multiplication

The Make It! Take It! Photo Company created 4 photo posters on Saturday and 3 photo posters on Sunday. If each photo poster contained 120 photos, how many photos did the Make It! Take It! Photo Company use to make the photo posters?